Preliminary Hazard Analysis

Selleys Padstow

Client:	Dulux Group
Job No:	7159
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Revision History

Date	Rev. No.	No. of Pages	Issue or Description	Checked By	Approved By	Date Approved
16/08/24	1	37	Initial issue PHA	N Browne	A Craven	16/08/24
26/08/24	2	34	Incorporation of feedback	N Browne	-	26/08/24
25/10/24	3	35	Update of site boundaries and expansion of environmental consequences	N Browne	-	25/10/24
28/10/24	4	36	Inclusion of surrounding developments	N Browne	-	28/10/24
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1. Background

1.1 Location

The proposed development applies to land identified as 15 Gow Street and 20 Gow Street, Padstow, being Lot 100 & 101 DP1011185 and Lot 53 DP1064349.

The Subject Site is currently occupied by Dulux Group and Selleys and constitutes an area of approximately 6ha at 15 Gow Street and 20 Gow Street, Padstow, being Lot 100 DP1011185 and Lot 53 DP1064349. It is proposed to redevelop the site to update the existing manufacturing and warehouse and distribution centre to current operational standards and allow continued operations.

The Subject Site is within the IN1 General Industrial RE1 Public Recreation zones pursuant to the Canterbury-Bankstown Local Environmental Plan 2023 (CBLEP2023). The Subject Site is located within the Canterbury-Bankstown Local Government Area (LGA). At present, 15 Gow Street is occupied by a number of industrial warehouse facilities and administration buildings operated by Dulux Group and Selleys with car parking provided opposite at 20 Gow Street, Padstow, which is owned by Dulux Group.

It is noted that the Department of Planning, Housing and Infrastructure (DPHI) have issued project-specific Secretary's Environmental Assessment Requirements (SEARs) for the proposed development, reference SSD-71052213.

1.2 Proposed Development

The proposed development seeks consent for the following works:

- Demolition of existing warehouse and maintenance building;
- Strip out and refurbishment of existing warehousing space to create a state of the art manufacturing facility with ancillary raw materials storage which will continue to be operated by the Dulux Group and Selleys;
- Construction of external tank storage and tanker unloading area; and
- Remodelling of the existing vehicle access to allow uni-directional truck flow

1.3 Planning Framework

The proposed development is classified as State Significant Development (SSD) on the basis that it falls within the requirements of Clause 10 of Schedule 1 of the of State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP), being:

10 Chemical, manufacturing and related industries

(1) Development that has an estimated development cost of more than $30 million for the purpose of the manufacture or reprocessing of the following (not including labelling or packaging)—

(a) soap, detergent or cleaning agents,
(b) paints, ink, dyes, adhesives, solvents,
(c) pesticides or inorganic fertiliser,
(d) pharmaceuticals or veterinary products,
(e) ammunition or explosives,
(f) oils, fuels, gas, petrochemicals or precursors,
(g) polymers, plastics, rubber or tyres,
(h) batteries or carbon black.

(2) Development with an estimated development cost of more than $30 million for any of the following purposes—

(a) liquid fuel depots,
(b) gas storage facilities,
(c) chemical storage facilities.

(3) Development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a major hazard facility within the meaning of Chapter 9 of the NSW Work Health and Safety Regulation 2017.

2 PHA Introduction

Selleys/Dulux are proposing to refurbish an existing warehouse to create a state-of-the-art manufacturing facility. This will incur changes to some of the existing dangerous goods storages.

In accordance with the Secretary's Environmental Assessment Requirements (SEAR's) request, an analysis of the dangerous goods storage and vehicle movements indicated that the quantity threshold in the guideline 'Applying SEPP33' for bulk storage of flammable liquids were exceeded at two locations. This concluded that the development would be classified as Hazardous and that a Preliminary Hazards Analysis (PHA) shall be prepared in accordance with the DoP Hazardous Industry Planning Advisory Paper No. 6 Hazard Analysis (HIPAP 6).

This PHA covers the risks associated with the existing storage of flammable liquids in Depots 1, 19 & 20 and the introduction of new storages for the automated production lines in the new manufacturing facility. This will include the effects of these storages on the surrounding land uses.

3 Major Findings and Recommendations

The total quantities of flammable liquids kept on site exceed the screening threshold for a Preliminary Hazard Analysis.

The multi-level risk assessment of the flammable liquids storages in Depots 1, 19 & 20 showed that the overall risk to society from the proposed development is negligible. A level 1 qualitative risk analysis, referred to as a Preliminary Hazard Analysis in *Applying SEPP 33* is deemed sufficient for the proposal.

There are extensive fire prevention controls and spill catchments for the site to prevent contaminated fire water from entering the Salt Pan Creek Reserve. See section 10.2.1.

The surrounding developments, individually and cumulatively, have negligible impact on the sensitive installations at Selleys.

Examination of the identified hazards for the storage and handling of the dangerous goods and combustible powders found that implementation of the risk controls resulted in an overall Low risk rating. The likelihood of catastrophic scenarios is considered to be rare and the overall risk to people and the environment for the facility is low.

The cumulative risk from the proposed SSD on the entire facility has made negligible difference due to the low quantities of new dangerous goods required for the new manufacturing facility and the significant separation from existing dangerous goods storages and manufacturing. The proposal to convert manufacturing to water-based technologies in 2031 would further enhance the Low risk rating.

It is the recommendation of the author that the proposed redevelopment of the site meets the requirements for approval in accordance with the SEPP 33 Preliminary Hazard Analysis.

4 Site Description

The site is described in the Consultant Brief for 15 and 20 Gow Street Padstow v3 and reproduced below.

The Site

The proposed development applies to land identified as 15 and 20 Gow Street, Padstow, being Lot 100 DP1011185 and Lot 53 DP1064349.

The Subject Site is currently occupied by Dulux Group and Selleys and constitutes an area of approximately 6ha. The Subject Site is within the IN1 General Industrial zone pursuant to the *Canterbury-Bankstown Local Environmental Plan 2023* (CBLEP2023). The Subject Site is located within the Canterbury-Bankstown Local Government Area (LGA). At present, 15 Gow Street is occupied by a number of industrial warehouse facilities and administration buildings operated by Dulux Group and Selleys with car parking provided opposite at 20 Gow Street, Padstow, which is owned by Dulux Group.

15 Gow Street is located on the southern side of Gow Street, with 20 Gow Street opposite to the north, between Fairford Road and Salt Pan Creek, Padstow. The Subject Site is located approximately 3.5km from Bankstown, 12km from Liverpool and 20km from Sydney CBD. Access to the road network is from the north of the Subject Site which is within close proximity to the South Western Motorway.

Surrounding land uses in the vicinity of the Subject Site include:

- North – a range of industrial developments zoned IN1 General Industrial and Bankstown STS Substation zoned SP2 Infrastructure;
    - East – Salt Pan Creek zoned RE1 Public Recreation and W1 Natural Waterways;
- South – a range of industrial developments zoned IN2 Light Industrial; and
- West - a range of industrial developments zoned IN1 General Industrial.

The location of the Subject Site and the existing development is depicted in **Figures 1** and **2** below.

Figure 1. Cadastral Map (Source: SIX Maps, 2024)

Figure 2. Aerial Map (Source: Nearmap, 2024)

Background

The proposed development will allow for Selleys to meet the growing demand for sealants, adhesives and fillers across Australia and New Zealand and will allow for future export to Asia as a result of the current and project growth of development, particularly in the south and north-west growth corridors. The proposed development will also secure the viability of the existing operations at the Subject Site as it revitalises underutilised industrial land with ageing infrastructure (being post WW2 factory construction with assets and technology linking back to this period), creating a state-of-the-art manufacturing facility which will allow for continued growth into the foreseeable future.

Proposed Development

The proposed development seeks consent for the following works:

- Demolition of existing warehouse and maintenance building, figure 5;
- Strip out and refurbishment of existing warehousing space to create a state-of-the-art manufacturing facility with ancillary raw materials storage which will continue to be operated by the Dulux Group and Selleys, figure 4.
- Construction of external tank storage and tanker unloading area, figure 4; and
- Remodeling of the existing vehicle access to allow uni-directional truck flow, figure 4.

The proposed development includes those works as identified in **Table 1** below.

TABLE 1. DEVELOPMENT STATISTICS	
Component	**Proposed Outcome**
Site Area	60,171m^2
Cost of Works	$123,241,221

The refurbished warehouse and the new building will be used for mixing, filling and storage of packaged products that are not dangerous goods in themselves but use small quantities of dangerous goods as raw materials per batch. There are automated, raw material supply vessels located under the southern canopy adjacent to the new manufacturing area and powder handling facility on the eastern side of the manufacturing area, figure 3.

The northern new building being located will be closer to the grassed area and the existing factory with a separation distance of at least 39 m. This remains well exceeds the minimum separation distance of 5 m in accordance with AS 3780, clause 6.3.2.3. The cumulative effect of the changed dangerous goods storages is negligible.

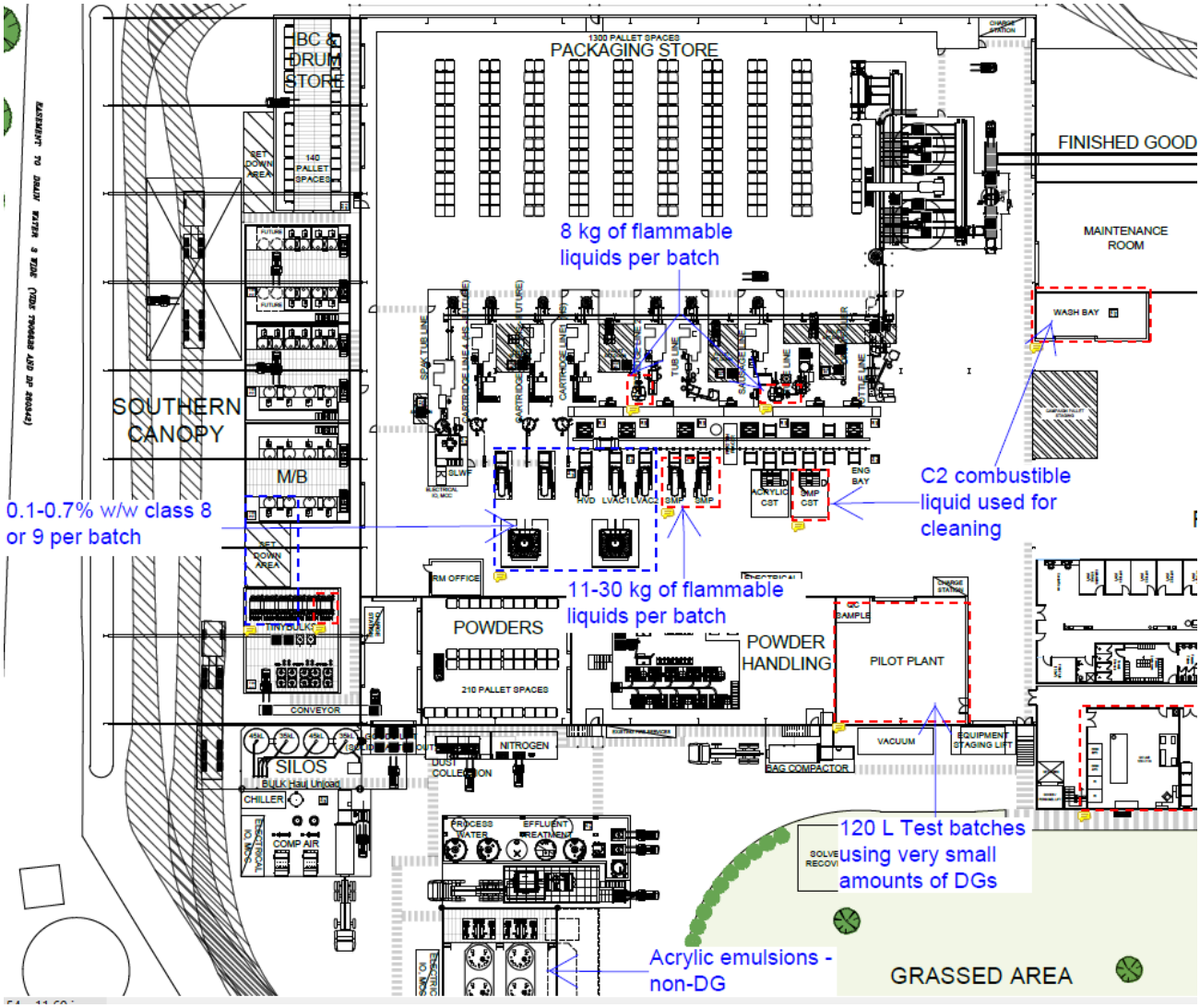

Figure 3. New manufacturing area and packaging store. (North is on right hand side of drawing)

Manufacturing of products containing flammable liquids will continue in the existing manufacturing plant on the east side of the property, figure 4. The maximum storage quantities of dangerous goods in Depots 17, 18, 19 & 20 are not expected to change until the facility changes to water-based technologies where the quantities used in the existing eastern manufacturing space will reduce significantly.

The new external tank storage will occupy the space currently used for Maintenance and will house four 50,000 L tanks of water based acrylic emulsions, figures 4 & 5. Theses are all classified as non-dangerous goods.

The Wash Bay will be relocated to inside the northern new building, figure 4. There will be a maximum of 200 L of a class 3 flammable liquid cleaning agent used within the Wash Bay.

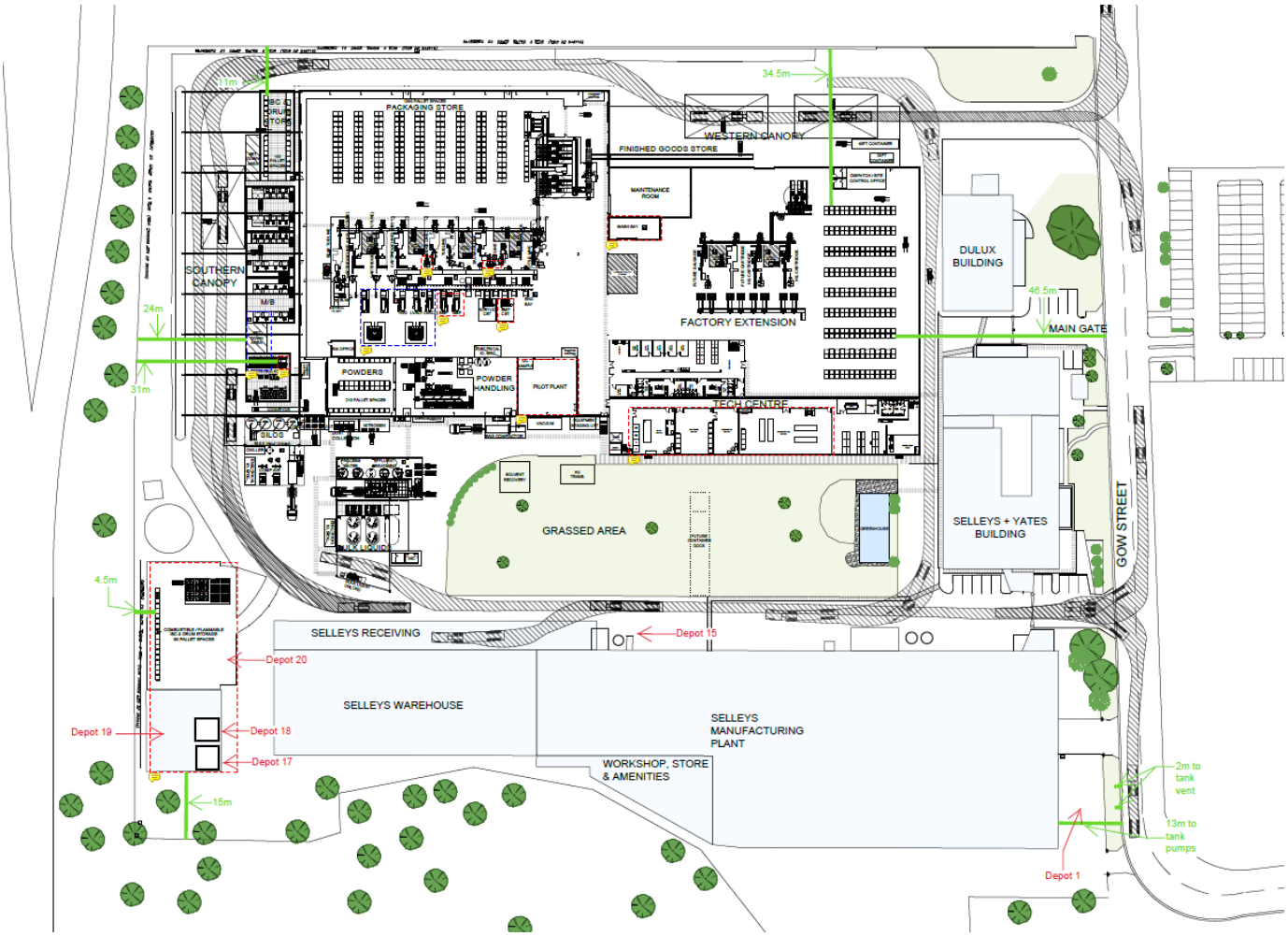

Figure 4. Depot locations and minimum distances to the property boundaries for all storages of class 3 flammable liquids and class 8 corrosive substances. (North is on right hand side of drawing)

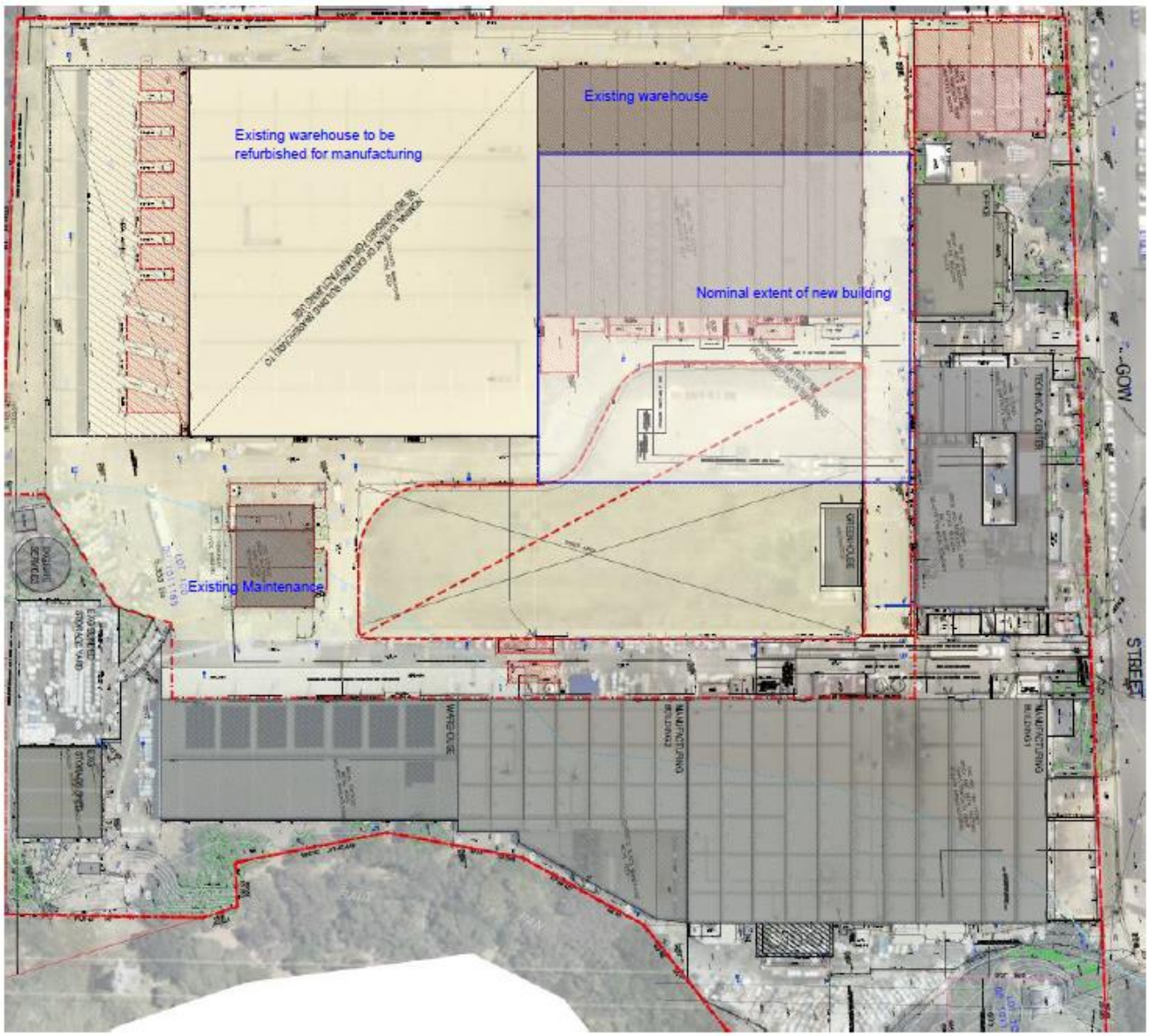

Figure 5. Existing site layout showing demolition works in red hatched areas and the nominal extent of the new building. (North is on right hand side of drawing)

4.1 Prevailing Wind Directions

The Bureau of Meteorology has a weather station at Bankstown Airport which is approx. 4 km from the Selleys site. The wind rose data indicates that the annual average prevailing wind direction in the mornings are from the west whereas in the afternoon they are from the east to southeast other than in winter where they are more from the south west, figure 6.

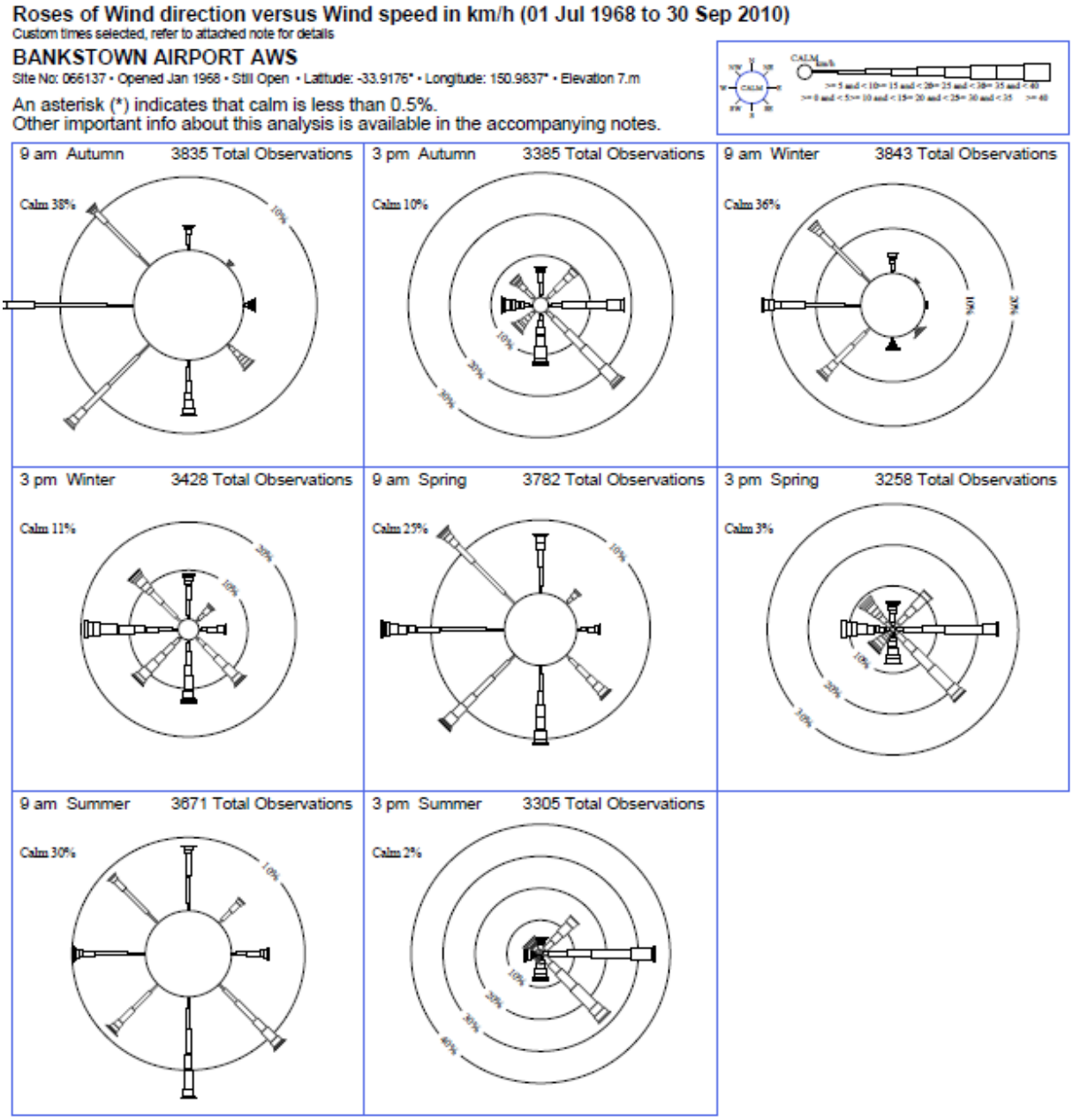

Figure 6. BOM wind direction roses for Bankstown Airport Automated Weather Station.

5 Dangerous Goods Manifest

5.1 Maximum DG Storage

The existing solvent based adhesives factory will continue to operate alongside the new manufacturing until further notice. The maximum storage quantities in each of the Depots will not be changed with manufacturing operations in the existing factory adjusted to meet demand. The maximum quantities for the existing factory and Depots are given in Table 1.

Table 1. Maximum Quantities of dangerous goods that will be maintained in existing storages (Depot legend is provided in Table 2)

Depot	2.1	2.2	2.2/5.1	3 PG II	3 PG III	4.1	5.1 PG III	5.2	6.1	8 PG II	8 PG III	9
1				88350	10150							
4					5000							
6					10000							
8					2000							
11								600				
12		800	74									
13						50	50					500
14					3000							
15										24000		
16												4000
17										9500	1000	200
18										5000	9600	1500
19				85800	114100						400	3000
20				60000	99000							6000
24	50			560	400							
25	500	250										
26	100	330										
Total	**650**	**1380**	**74**	**234710**	**243650**	**50**	**50**	**600**	**0**	**38500**	**11000**	**15200**
A - Class 3 Total					478360							
B - Class 3 Under Ground					98500							
C - Class 3 UG ÷ 5					19700							
Class 3 Above Ground (= A – B + C)					399560							

Table 2. Legend for existing Depots.

Depot	DG Class	Description
1	3	Underground flammable liquid tanks
2	3	Transient finished goods
3	3	Section 5 Can line
4	NH	Filling lines
5	NH	Linseed oil tanks
6	3	Mixing areas
7	NH	Powder cell
8	NH	Mixing areas
9	NH	AGT Emulsion tanks x 3
10	3	Cleaning bay
11	5.2	Undercover store
12	2.2, 2.2/5.1	Factory Gas bottle store
13	NH	Pre-weigh raw materials
14	NH	Filling line
15	8	Sodium hypochlorite tanks x 2
16	9	Factory packaging warehouse
17	8	Undercover acid storage
18	8	Undercover alkali storage
19	3	Undercover flammable liquids storage
20	3, 8, 9	Outdoor packages store
21	C1	Maintenance diesel
22	NH	Dulux warehouse
23	NH	Rota-Cota warehouse
24	2.1, 3	Laboratory
25	2.1, 2.2	Outdoor gas bottle store
26	2.1,2.2	Outdoor gas bottle store

The new factory makes products that are not classified as dangerous goods but use small quantities of dangerous goods as raw materials per batch, Table 3. There are automated, raw material supply vessels located under the southern canopy adjacent to the new manufacturing area, figure 3. The maximum quantities of raw materials for the new factory are given in Table 3. Of the 38,060 L of dangerous goods used as raw materials there is 31,060 L of C1 and C2 combustible liquids which are excluded from the PHA screening thresholds.

Table 3. Quantities of dangerous goods in the new factory raw material storages under the southern canopy.

	2.1	2.2	2.2/5.1	3 PG II	3 PG III	C1	C2	4.1	5.1 PG III	5.2	6.1	8 PG II	8 PG III	9
Silos				1,250										
Tiny Bulk						1,500	4,500					750		500
Mini Bulk							12,000					1,500		3,000
IBC Drum Store														
Storage Tank						13,000								
Microsystem							60							
Total				**1,250**		**14,500**	**16,560**					**2,250**		**3,500**

The aggregate of all dangerous goods for the existing and new manufacturing areas are given in Table 4.

Table 4. Aggregate Maximum Quantities of dangerous goods for the existing and new storages.

Depot	2.1	2.2	2.2/5.1	3 PG II	3 PG III	C1	C2	4.1	5.1 PG III	5.2	6.1	8 PG II	8 PG III	9
Total new				1,250		14,500	16,560					2,250		3,500
Total existing	650	1380	74	234710	243650	0	0	50	50	600	0	38500	11000	15200
Aggregate Total	**650**	**1380**	**74**	**235,960**	**243,650**	**14,500**	**16,560**	**50**	**50**	**600**	**0**	**40,750**	**11,000**	**18,700**

6 Risk Screening

6.1 Maximum DG Storage

The screening method described in Applying SEPP 33 (Department of Planning 2011) provides the first step in the analysis. The screening method is based on broad estimates of the possible off-site effects or consequences from hazardous materials present on the site, taking into account local characteristics.

For most classes of dangerous goods kept at the site, the appropriate screening method is comparison of the total quantities with the minimum quantity thresholds from Applying SEPP 33, Table 3. These are reproduced in Table 5.

For class 3, flammable liquids, no further analysis is required if the prescribed distance to the property boundary is less than the screening threshold quantity for the whole of the site, Table 1. This is a conservative estimate based upon the ability to control an incident of this scale within the property boundary. The safety management regime relies upon observance of the requirements of engineering codes and standards.

Note: The quantities of dangerous goods in the existing mixing and filling lines (Depots 2, 3, 4, 6, 8 and 14) are included in the maximum quantities used for storage on site.

Table 5. Screening Method based upon aggregate quantities for the whole site

DG Class	Minimum Quantity Threshold	Minimum Distance	Maximum Quantity Stored on Site	Complies
	Applying SEPP 33, Table 3	Applying SEPP 33, Figure 9		
2.1 aerosol cans	100 kg	-	50 kg	Yes
3 PGII & PG III	-	10.8 - 11.7 m	*378,600 L	No
4.1	5,000 kg or L	-	50 kg	Yes
5.1	5,000 kg or L	-	50 kg or L	Yes
5.2	10,000 kg or L	-	600 kg or L	Yes
6.1	2,500 kg or L	-	0	Yes
8 PG II	25,000 kg or L	-	#16,750 kg or L	Yes
8 PG III	50,000 kg or L	-	11,000 kg or L	Yes
9	N/A	-	4,500 kg or L	Yes

see section 7.1 for calculation of threshold quantity

* see calculation for threshold quantity in section 9.1.

The maximum storage quantities for class 8 PG II substances exceed the quantity threshold and the minimum distances for combined class 3 PG II and PG III flammable liquids to areas where there could be off-site consequences are exceeded. These two classes require further analysis in accordance with *Applying SEPP 33*.

The maximum storage quantities for all other classes of dangerous goods do not exceed the thresholds and do not require further analysis, Table 5.

7 Class 8 Corrosive Substances

7.1 Level of Analysis

There is 38,500 kg or L of class 8 PG II corrosive substances kept in Depots 15, 17 and 18, figure 7 and Table 6. The total quantity exceeds the screening threshold quantity and requires further analysis.

The corrosive substances are stored at three locations with the adjacent Depots 17 & 18 grouped as one storage location and Depot 15 being isolated from the combined Depots 17 & 18 by approx. 85 m and from the storage under the southern canopy by more than 40 m. Depots 17 and 18 are for packaged corrosive substances, the quantity under the southern canopy are in mini bulk vessels whereas Depot 15 stores sodium hypochlorite solution in two bulk tanks and these are treated as separate storages. This methodology is allowed by The Multi-level Risk Assessment Guideline, Appendix A1.1.1.

None of these storages exceed the storage thresholds in Table 5.

Table 6. DG Class 8 storage locations and quantities

Depot	DG Class	Maximum Quantity Stored on Site
Isolated Depot		
15	8 PG II Alkali	24,000 L
Sub-Total		24,000 L
Adjacent Depots		
17	8 PG II Acid	5,500 kg or L
17	8 PG II Alkali	0
17	8 PG II N.O.S	4,000 kg or L
18	8 PG II Acid	1000 kg or L
18	8 PG II Alkali	3500 kg or L
18	8 PG II N.O.S	500 kg or L
Under southern canopy	8 PG II	2,250
Sub-Total	8 PG II	16,700 kg or L

The multi-level risk assessment guideline, section 3.1.2 states that the storage of corrosive substances have limited potential for off-site harm provided appropriate technical and management controls are observed. Consequently, a qualitative analysis, which includes a demonstration of compliance with all relevant standards and codes, should normally suffice. In particular, adequate measures to protect the biophysical environment should be clearly demonstrated.

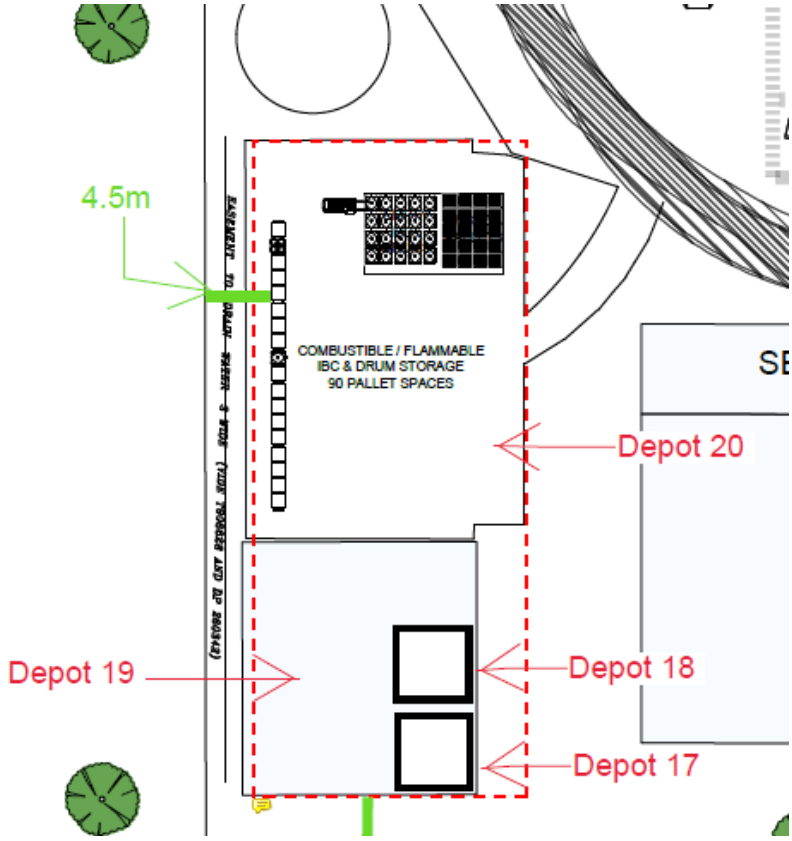

Figure 7. Detail of Depots 17 to 20 showing minimum distances to the property boundaries for Depots 19 & 20

None of these grouped storages exceed the storage threshold, figure 4 and detail in figure 5.

7.2 Hazard Identification

For corrosive substances, it is not easy to establish a clear-cut relationship between distance and the level of harm. For this reason, thresholds are based on quantity only. The values chosen are such that there is little likelihood of harm outside the site boundary below the threshold, even when the material is kept relatively close to the site boundary.

The main aims of a Preliminary Hazard Analysis are:

1. Identify all potential hazards and events that could result in an incident
2. Rank the identified hazards according to their severity
3. Identify hazard controls and follow-up actions

The stores for the corrosive substances are in combined Depots 17 & 18 and store a variety of corrosive substances in packages ranging from 20 L to 1,000 L, figures 4 and 8. These combined storages do not exceed the quantity screening threshold, Table 6. Based upon this assessment a Level 1 Preliminary Hazard Analysis is not considered appropriate for the storage areas.

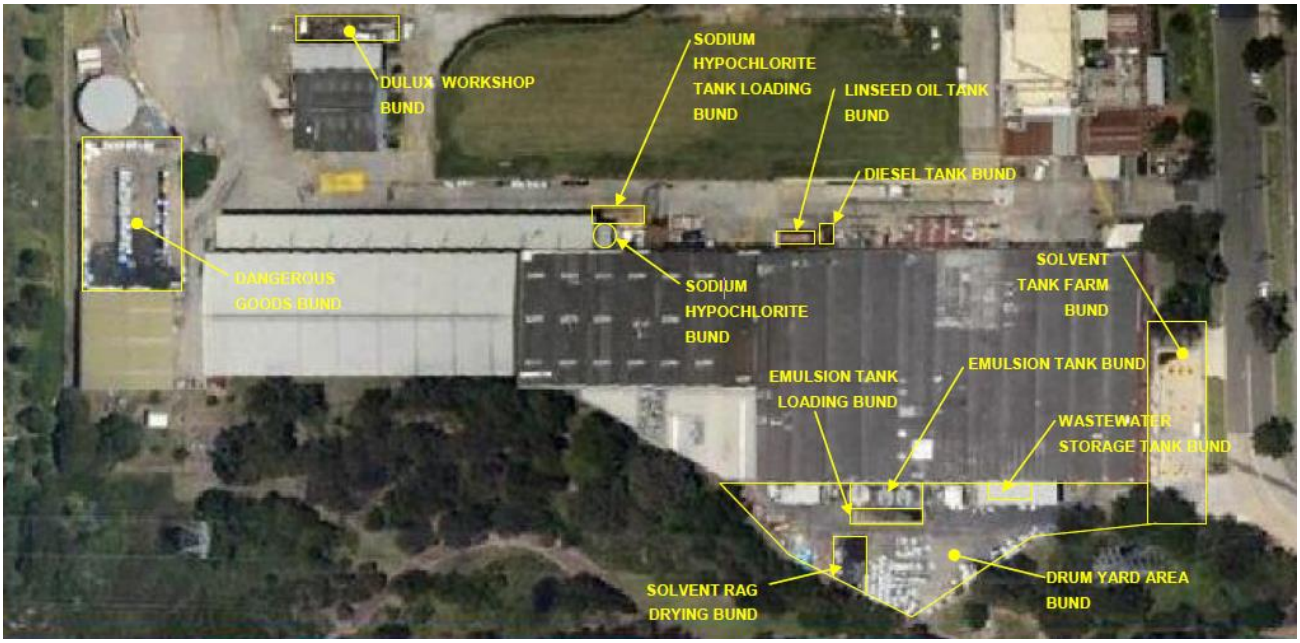

Figure 8. Extent of bunded areas around dangerous goods storages – see appendix 10.2.

7.3 Conclusions

At this point of the analysis the proposed design does not require a Preliminary Hazard Analysis for corrosive substances.

8 Combustible Powders

In the new manufacturing area, there is provision for 210 pallet spaces of powders, figure 8a. There are seven combustible powders described in the manifest with an overall usage of 22,339 kg per year. A maximum stock holding at any time was not provided. The remaining powders are not combustible.

These powders are not classified as dangerous goods but are described on the safety data sheets as combustible powders. Transfer of small quantities is by bag or bucket with the room ventilation filtered through a dust collector. Larger quantities are transferred by vacuum transfer into an atmosphere of nitrogen in the mixing vessels and transfer lines to prevent ignition.

A hazard analysis is included in section 10.2 of this report.

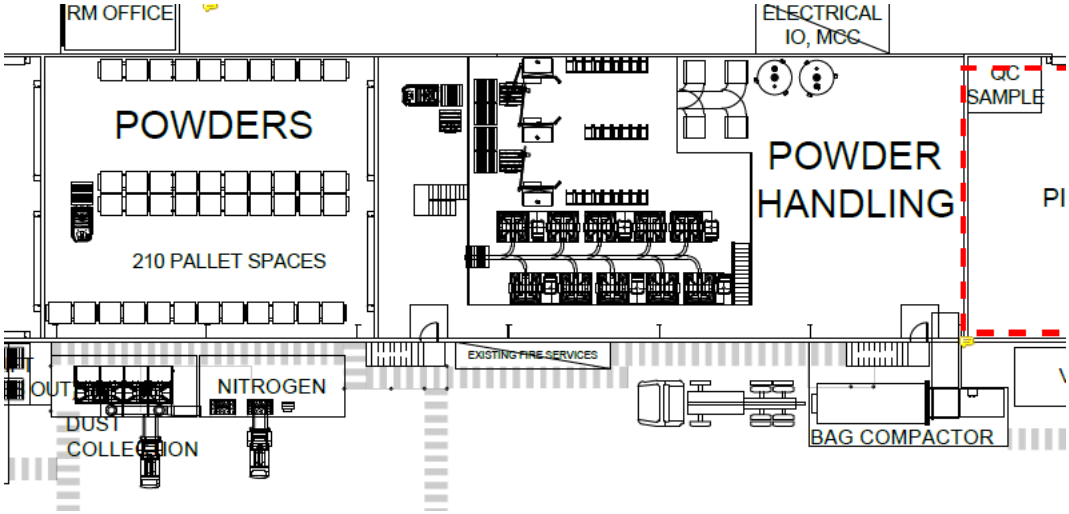

Figure 8a. Powder storage and handling areas on west side of the new manufacturing area.

8.1 Conclusions

At this point of the analysis the proposed design does not require a Preliminary Hazard Analysis for the powders as good hazard controls are to be provided.

9 Class 3 Flammable Liquids

The minimum distances to the property boundaries are met for all class 3 flammable liquids storages other than in the following locations –

Depot 1 – Class 3 underground bulk tanks tanker fill points	1 m	figure 9
Depot 19 – Class 3 Drum and pail storage	4.5 m	figure 4
Depot 20 – Class 3 IBC & Drum Storage	4.5 m	figure 4

Depots 19 and 20 are adjacent to one another and pose a similar hazard. The total quantity of class 3 flammable liquids will be combined as their cumulative effect is likely to be significant.

The set back distances to all other storages of class 3 flammable liquids are met, figure 4, along with the minimum segregation distances of class 3 flammable liquids of 5 m from the hypochlorite tanks (Depot 15) which are incompatible storages.

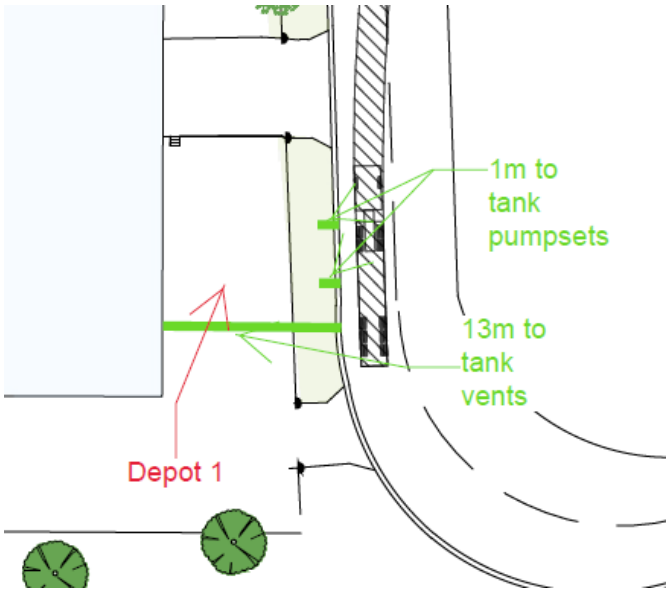

Figure 9. Minimum distances to the property boundaries for Depot 1 fill points and tank vents

9.1 Minimum Distance Screening Calculations

The screening method described in 'Applying SEPP 33' is based upon a broad estimate of the possible off-site effects or consequences from hazardous materials present on the site, taking into account locational characteristics.

No further analysis is required if the relationship between quantity and distance for heat radiation effects is less than the screening threshold.

If the relationship between quantity and distance exceeds the screening threshold, further analysis is required.

The aggregate quantity of class 3 flammable liquids of packing groups II and III for the site is 478,360 L. Of this 98,500 L is stored underground in bulk tanks. The underground storage can be divided by a factor of 5 reducing the total site quantity subject to a PHA to 399,560 L. Combustible liquids are excluded from the screening thresholds in accordance with 'Applying SEPP 33', section 7.1.

Stored above ground	Under Southern canopy, flammable	1,250 L	
Stored above ground	All Other Depots	20,960 L	
Stored above ground	Depots 19 & 20	358,900 L	358,900 L
Stored underground	Depot 1	98,500 L ÷5 quantity =	19,700 L
Total			400,810 L

The minimum separation distances are derived from *SEPP 33, figure 9* and shown in figure 10. These provide the minimum separation requirements from off-site effects of –

	Depots 19 + 20	UG Tank fill points	Southern Canopy
Sensitive uses	11.7 m	8.0 m	0 m
Other uses	10.8 m	5.4 m	0 m

Note: The aggregate quantity for Depots 19 & 20 is 400,810 L which is approx. 87% of the above ground total.

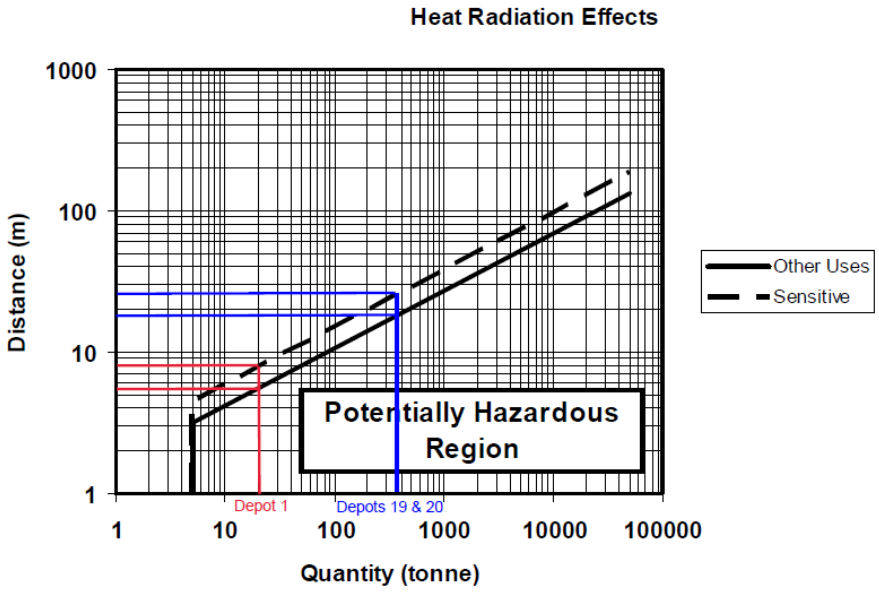

Figure 10. SEPP 33, figure 9 showing minimum separation requirements from off-site effects.

9.2 Transport Screening Threshold

SEPP 33 screening also requires a study of the transport/delivery frequencies for the dangerous goods at the site, Table 7. The proposed development may be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the annual or weekly cumulative vehicle movements shown in Table 8.

The forecast deliveries to the site are scaled to 2031 based upon 2.5% pa growth, Table 8. These transportation movements are below the thresholds for the relevant dangerous goods classes and packing groups. There is no requirement for a PHA based upon the transport screening thresholds.

Table 7. Transportation Screening Threshold from 'Applying SEPP 33' page 18.

Table 2: Transportation Screening Thresholds

	Vehicle Movements		**Minimum quantity***	
	Cumulative	Peak	**per load (tonne)**	
Class	Annual *or*	Weekly	Bulk	Packages
1	see note	see note	see note	
2.1	>500	>30	2	5
2.3	>100	>6	1	2
3PGI	>500	>30	1	1
3PGII	>750	>45	3	10
3PGIII	>1000	>60	10	no limit
4.1	>200	>12	1	2
4.2	>100	>3	2	5
4.3	>200	>12	5	10
5	>500	>30	2	5
6.1	all	all	1	3
6.2	see note	see note	see note	
7	see note	see note	see note	
8	>500	>30	2	5
9	>1000	>60	no limit	

Note: *Where proposals include materials of class 1, 6.2 or 7, the Department of Planning should be contacted for advice. Classes used are those referred to in the Dangerous Goods Code and are explained in Appendix 7.*

** If quantities are below this level, the potential risk is unlikely to be significant unless the number of traffic movements is high.*

Table 8. Forecast transport movements of class 3 flammable liquids where the individual delivery quantities are above the minimum thresholds.

Type	PG	Threshold (kg)	2031 Delivery Count	
			Weekly Peak	Annual
Bulk	II	3,000	5	102
Bulk	III	10,000	0	0
Packages	II	10,000	0	0
Packages	III	0	2	36

- Data based on current deliveries exceeding threshold and scaled to 2031 based on 2.5%pa growth rate as per Board paper Financials
- In reality, it expected that most of the solvent-based production will have transitioned to waterbased or SMP technologies in 2031.
- As such, the table above is worst-case, but low likelihood.

9.3 Conclusion

It has been determined by assessment of this proposal under the NSW State Environment Planning Policy No. 33 (SEPP 33) that the site is deemed 'potentially hazardous'. The transport screening thresholds are met but the proposed design does not achieve all the required class 3 flammable liquids setback distances.

The site and its proposed design require further analysis and a Preliminary Hazard Analysis is to be completed.

10 Multi-Level Risk Assessment Approach

The Assessment Guideline – Mult-level Risk Assessment describes three levels of assessment that are dependant upon the outcome of a preliminary analysis.

Level 1 – qualitative analysis which uses hazard identification techniques

Level 2 – partially quantitative risk analysis which uses hazard identification and quantification of significant off-site risks

Level 3 – quantitative risk analysis which applies full and detailed quantification of all risks as prioritised in *HIPAP No. 6 – Hazard Analysis*.

The method used is a modified version of the *Manual for the classification of risks due to major accidents in process and related industries (IAEA, Rev. 1. 1996)*. It should be noted that the full IAEA method covers fixed installations and transport (including by waterways and pipeline). For simplicity, only the part of the method dealing with fixed installations is covered here.

The IAEA method is risk based and relies on a broad estimate of the risks due to major accidents from the manufacture, storage, handling and transport of hazardous materials.

The results are expressed in terms of societal risk, rather than individual risk. Societal risk of death is defined in the IAEA method as the relationship between the number of people killed in a single accident and the chance or likelihood that this number will be exceeded. This is compared with criteria for determining the appropriate level of further risk assessment.

A plan of the area is shown in figure 11 and estimates of the population in this area have been made. There are two sensitive uses in the area being the M5 motorway and Saltpan Creek Reserve.

10.1 Risk Classification and Prioritisation

10.1.1 External Consequences

The external consequences of an incident are identified using the following equation:

$$C_{a,s} = A \,.\, d.\, f_A \,.\, f_m$$

Where A = affected area
d = population density in populated areas within the affected zone
f_A = area correction factor for the distribution of population in the affected zone
f_m = correction factor for mitigation effects

The first step is to identify the Reference Number for the type of storage. IAEA Table II provides a Reference Number of 6 for paints/pigments using solvents.

At Depots 19 & 20 the site contains a maximum of 358,900 L of class 3 flammable liquids (packing groups II and III) that are stored in a variety of packaging including 20 L pails, 200 L drums and 1,000 L IBC's. The underground storage at Depot 1 has a total capacity of 98,500 L. A note on IAEA table IV(a) uses only 20 % of the total capacity for allocation of the Effect Category, i.e. 19,700 L.

The flammable liquids are allocated a reference number and a corresponding Effect Category using IAEA Table IV(a).

Material	Inventory	Reference number from IAEA Table IV(a)	Effect Category from IAEA Table IV(a)
Depots 19 & 20 Above Ground Flammable Liquids (PGII & PGIII)	358,900 L	6	DII
Depot 1 Underground Tanks Flammable Liquids (PGII & PGIII)	19,700 L	6	BII

These results are then used to obtain the maximum effect distance and area of effect from IAEA Table V. This gives the affected area (A in the above equation for external consequences).

Material	Effect Category from IAEA Table IV(a)	Effect Area from IAEA Table V	Maximum Distance from IAEA Table V
Above Ground Flammable Liquids (PGII & PGIII)	DII	6 ha	100 – 200 m
Underground Tanks Flammable Liquids (PGII & PGIII)	BII	0.4 ha	25 – 50 m

Note: 1 hectare (ha) = 10,000 m^2

For the purpose of illustration, the 6 ha effect area is represented by a circle that has a radius of 138 m and the 0.4 ha effect area is an ellipse with a radius of 3.6 m from their foci as shown in figure 11.

For Depots 19 & 20, approximately 25% of the effect area is on the Selleys site with the balance encroaching on the Salt pan Creek Reserve to the east and the South-Western Motorway and a couple of smaller factories to the south, figure 9.

Figure 11. 0.4 ha and 6 ha effect areas and 50 m and 200 m maximum distance around Depots 19 & 20 an underground tank fill points – Google Maps.

The next step is to determine the population distribution that will be affected by an accident. The IAEA Table VI provides guidance for population density with an allowance for a correction factor as could be required. A conservative estimate of 20 persons per hectare is used, representing a quiet residential area.

10.1.2 Possible Number of Fatalities

The area factor for the exposed area, f_A, is calculated to estimate the fraction of the exposed area that actually lies off-site.

Depots 19 & 20

This is estimated to be approx. 75% of the effect area for Depots 19 & 20 giving an off-site area factor for f_A of 0.75. This number can be further reduced to account for approx. one third of the off-site effect area being populated. This reduces the off-site effect area to 0.25.

The mitigation correction factor f_m for reference number 6 is 1 from IAEA Table VIII.

These numbers are entered into the formula for the external consequences.

$$C_{a,s} = A \,.\, d. \, f_A \,.\, f_m$$

$$C_{a,s} = 6 \text{ ha. } 20 \text{ persons/ha. } 0.25 \,.\, 1$$

$$C_{a,s} = 30 \text{ fatalities}$$

Depot 1

The population distribution will be very low as the effect area is largely the street and car park on the opposite side of the street, figure 9. A conservative estimate of 50% of the effect area for Depot 1 gives an off-site area factor for f_A of 0.5. This number can be further reduced to account for approx. 40% of the off-site effect area being populated. This reduces the off-site effect area to 0.2.

These numbers along with the mitigation correction factor f_m of 1 (from above) are entered into the formula for the external consequences.

$$C_{a,s} = A \,.\, d. \, f_A \,.\, f_m$$

$$C_{a,s} = 0.4 \text{ ha. } 20 \text{ persons/ha. } 0.2 \,.\, 1$$

$$C_{a,s} = 1.6 \text{ fatalities}$$

10.1.3 Frequency of Occurrence

The frequency of occurrence of an accident is now estimated, using an average probability number for the installation and substance, and then correcting this for safety systems, organisational and management safety and wind direction towards the populated area.

The method used for estimating probability is based on probability numbers related to the type of installation and substance involved, together with correction factors for:

- Average probability of an incident ($N^*_{i,s}$)
- The frequency of loading/unloading operations, (n_l)
- Safety systems associated with flammable substances (n_f)
- Organisational and management safety (n_o)
- Wind direction towards populated areas (n_p)

The probability number is given by the formula:

$$N_{i,s} = N^*_{i,s} \cdot n_l \cdot n_f \cdot n_o \cdot n_p$$

Where $N_{i,s}$ is the average probability number for the installation and the substance.

The frequency is calculated from the probability number.

$N = | \log_{10} P |$

			Depots 19 & 20		Depot 1	
IAEA Table No.			**Parameter**	**Result**	**Parameter**	**Result**
IX	Standard probability Number - $N^*_{i,s}$	Reference Number (Storage)	6	7		7
X(a)	Probability Number correction factor - n_l	Deliveries per year	102	-1	36	0
XI	Probability Number correction factor - n_f	For gases only	N/A	0		0
XII	Correction parameter for organizational safety - n_o	Average industry practice		0		0
XIII	Correction for wind direction towards residential populated areas - n_p	Effect area category II	5%	0.5		0.5

Using these numbers the probability calculates as:

$$N_{i,s} = N^*_{i,s} \cdot n_l \cdot n_f \cdot n_o \cdot n_p$$

Depots 19 & 20

$$N_{i,s} = 7_s - 1 + 0 + 0.5 + 0.5$$

$$N_{i,s} = 7.0$$

Converting the probability number into frequency using IAEA Table XIV gives a result of

Frequency = | log10 P | = 1 x 10^{-7} or one per ten million events per year.

Depot 1

$$N_{i,s} = 7_s - 0 + 0 + 0.5 + 0.5$$

$$N_{i,s} = 8.0$$

Converting the probability into frequency using IAEA Table XIV gives a result of

Frequency = | log10 P | = 1 x 10^{-8} or one per one hundred million events per year.

These results are illustrated on figure 12. The risk to society is "Negligible" for Depot 1 and falls just into the "Negligible" region for Depots 19 & 20. The risk to society is close to the "As Low As Reasonably Practical" (ALARP) region between the red and green lines for Depots 19 & 20 and further emphasis on reducing the risk is encouraged.

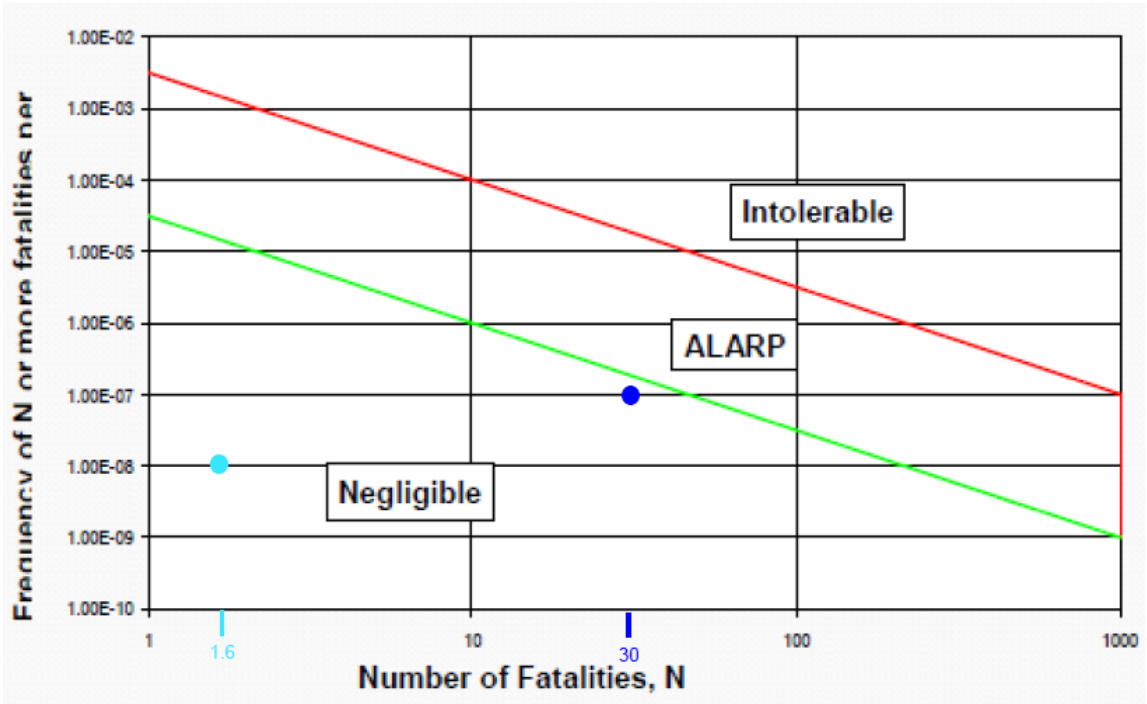

Figure 12. Indicative Societal Risk. Dark blue – Depots 19 & 20, Pale blue – Depot 1

The SEPP 33 Assessment Guideline (Multi-level Risk Assessment), section 3.3.2 emphasises that the criteria in figure 12 are indicative and provisional only and do not represent a firm requirement in NSW.

Within the ALARP region, the emphasis is on reducing risks as far as possible towards the negligible line.

10.2 Hazard Identification

The flammable liquids are covered by the risk classification and prioritisation method.

A Quantitative Risk Assessment may not be required if the risk classification and prioritisation stage indicates a negligible level of societal risk. However, risk classification and prioritisation is imprecise and only considers one aspect of risk (human fatality). Other factors need also to be taken into account.

Four conditions need to be satisfied before no further quantification of risk would be required:

- *all points on the indicative societal risk curve produced from the risk classification and prioritisation should be below the negligible line* – **This item is satisfied (see section 10.1 for the full analysis).**
- *there should be no events with consequences extending significantly beyond the site boundary at a frequency of greater than 1 x 10^{-7}* – **This item is satisfied (see section 10.1 and figure 12for the full analysis).**
- *the process or operation should be well understood and covered by established and recognised standards and codes of practice* – **The designs for the storages are in accordance with the requirements of AS 1940.**
- *if there are any off-site consequences these will not impact on any sensitive adjoining land use* - **A hazard identification and word analysis is provided in appendix 12.2 for the major risk scenarios. This demonstrates that the overall risk of any off-site consequences is Low with the proposed risk controls implemented. See expanded analysis in section 10.2.1.**

10.2.1 Off-Site Environmental Consequences

The Salt Pan Creek Reserve begins at the site boundary, figures 1 & 2, and Depot 19 is 15 m from the site boundary, figure 4.

A fire in the flammable liquids storage will generate significant amounts of heat and clouds of thick, black, toxic smoke. Fire-fighting water will knock down some of the smoke along with entrapped toxic chemicals that could be washed into Salt Pan Creek. These chemicals are harmful to aquatic plants and animals.

A spill of flammable liquids in Depots 19 and 20 will be captured by the spill containment bunds. The bunds are designed in accordance with the requirements of AS 1940 and have an allowance for an extra 10% capacity to cope with wind action.

Fire-fighting water being used on a fire in the compound could be captured in the bund and reduce the available capacity to capture a spill. The Padstow site includes a 100,000 L site containment tank as part of its First Flush Stormwater System. This would also capture contaminated fire water that escapes the bund.

Likelihood

The likelihood of fire scenarios at Depots 19 & 20 are reduced by ensuring all ignition sources are excluded from the areas unless suitably rated (e.g. electrical fittings, forklifts), fire detection and alarm are provided within the area, early response to external fires along with the significant reduction in quantities of packaged flammable liquids being kept once manufacturing is converted to water based technologies in 2031.

Overall, it is unlikely that a fire will be initiated in Depots 19 and 20 due to the established risk controls.

Consequences

The Padstow site includes a 100,000 L site containment tank as part of its First Flush Stormwater System.

During a rainfall event, stormwater entering pits/drains on the roadways enters the stormwater system and flows to Pit 16, Figure 13. Under normal circumstances stormwater will flow through the 25kL Triple Interceptor Pit (TIP) and collect in the 100kL Site Containment Tank (SCT). Stormwater leaves site and enters Salt Pan Creek via Pit 18 after either coming from Pit 16 or from the 100kL Site Containment Tank.

Upon activation of any of the Emergency Spills Alarm Buttons all 3 control Valves in Pit 16 will CLOSE containing any further stormwater/spill/firewater on-site.

The output from activation of a 10 L/sec fire hydrant is 12,000 l over 20 minutes. With three hydrants fully activated it would take one hour to generate 98,000 L of firewater and fill the Site Containment Tank.

A fire at Depot 1 would not require the use of more than one hydrant. A fire at Depots 19 & 20 would likely use three hydrants and be controlled quickly due to its isolation from other buildings and storages.

The consequences are likely to be minor as a large proportion of contaminated fire water will be captured on-site and not flow into Salt Pan Creek.

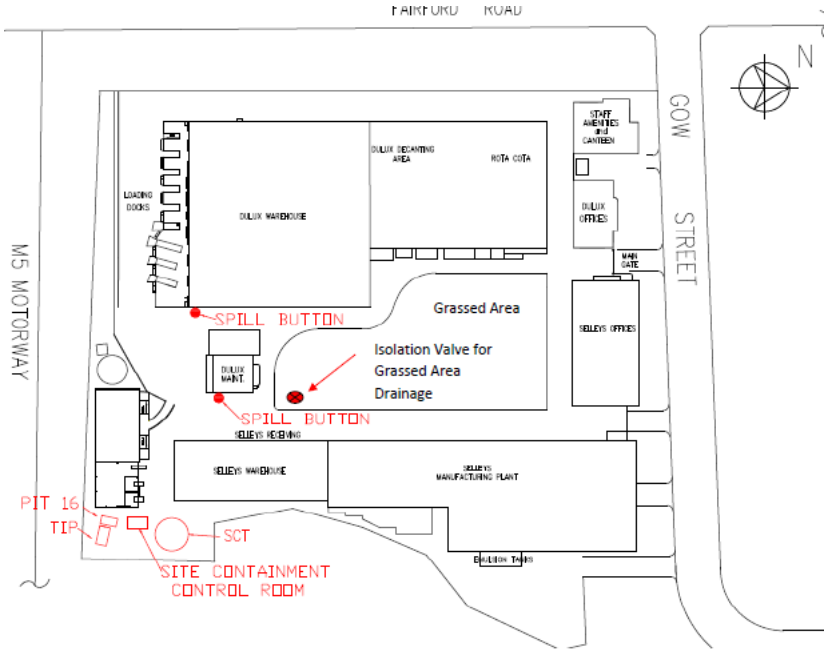

Figure 13. Locations of Spill Buttons, Pits, Triple Interceptor Pit and Site Containment Tank

10.2.2 Surrounding Developments

The Selleys site is surrounded by light industrial, retail and hospitality developments, figure 1. The developments within 200 m of Depot 1 or Depots 19 & 20 are listed in Table 9 and show a wide range of businesses, all of which, individually and cumulatively, have negligible impact on the sensitive installations at Selleys.

Table 9. Surrounding Developments

Address	Occupancy
Gow Street North	
2 Gow Street	Furniture by Design
20 Gow Street	Dulux Car Park
26 Gow Street	Pizzology
30 Gow Street	Rentcorp Hyundai Forklifts
40 Gow Street	Inspiration Paint Design
Gow Street - West of Selleys	
31 Gow Street	Chataura Dairy Products
33 Gow Street	NA Aust Group
35 Gow Street	De Palma Salumi, B2B Food Products
37 Gow Street	Fred Rose Bathrooms

Address	Occupancy
39 Gow Street	Globe Pest Solutions
41 Gow Street	Compact Air
Fairford Road - West of Selleys	
48-52 Fairford Road	BBC Tile Centre
54 Fairford Road	Bankstown Carpet Court
56 Fairford Road	Rockdale Mattress Factory
60 Fairford Road	Permagard automotive
South of Selleys	M5 Motorway
92 Bryant Street	St George Interiors
92 Bryant Street	Revive Technologies
94 Bryant Street	AMMR Racing
94 Bryant Street	Bathroom Supply Store
94 Bryant Street	Flipco Group
94 Bryant Street	FM Direct
94 Bryant Street	Simply Natural Oils
94 Bryant Street	Pro Spec door Services
94 Bryant Street	Kristine Klean
East of Selleys	Salt Pan Creek Reserve

10.3 Conclusion

The multi-level risk assessment has shown that the overall risk to society from the proposed development is negligible. A level 1 qualitative risk analysis, referred to as a Preliminary Hazard Analysis in Applying SEPP 33 is deemed sufficient for the proposal.

There are extensive fire prevention controls and spill catchments for the site to prevent contaminated fire water from entering the Salt Pan Creek Reserve. See section 8.2.1.

The surrounding developments, individually and cumulatively, have negligible impact on the sensitive installations at Selleys.

The Hazard Identification Analysis for the proposed flammable liquid storages has an overall Low risk rating for any off-site consequences, with implementation of the risk controls.

All equipment must be installed to manufacturer's specifications and must comply with all relevant standards listed within. Specific safety features of the site are to be maintained and reviewed on a regular basis to ensure that they maintain, if not exceed industry standards.

11 References

Document	Revision	Description
BB-1000-LAY-0002	A3	Factory Layout Option – New SAF Manufacturing
SC-2358	D	Fire Risk Management Plan – Bunds and Drains
SC-1525Haz	0	Hazardous Areas
PPM-0105		Padstow Site First Flush System – System Description, Spill Response & Operating Instructions
AS/NZS 1841.5	2007 (R 2021)	Portable fire extinguishers. Specific requirements for powder type extinguishers
AS 1940	2017	The storage and handling of flammable and combustible liquids
AS 3780	2023	The storage and handling of corrosive substances
AS ISO 31000	2018	Risk management guidelines
AS/NZS 60079.10.1	2022	Explosive atmospheres, Part 10.1: Classification of areas – Explosive gas atmospheres
IAEA-TECDOC-727	1	Manual for the classification and prioritization of risks due to major accidents in process and related industries
Department of Planning NSW, State Environmental Planning Policy 33, Hazardous and Offensive Development Application Guidelines, Hazardous Industry Planning Advisory Paper No. 4 'Risk Criteria for land use safety planning'		
Department of Planning NSW, State Environmental Planning Policy 33, Hazardous and Offensive Development Application Guidelines, Hazardous Industry Planning Advisory Paper No. 6 'Guidelines for Hazard Analysis'		
Department of Planning NSW, State Environmental Planning Policy 33, Hazardous and Offensive Development Application Guidelines 'Applying SEPP 33'		
Department of Planning NSW, State Environmental Planning Policy 33, Hazardous and Offensive Development Application Guideline 'Multi-level Risk Assessment'		

12 Appendices

12.1 Hazard Identification Methodology

The identified hazards are summarised in appendix 10.2 along with control measures for the existing factory and the proposed new development. An initial risk rating is provided where no controls are implemented. A final, or residual, risk rating is then determined where the controls are implemented. These consider the hierarchy of risk controls along with what is reasonably practicable to achieve. Definitions are provided below the risk matrix table.

The risk matrix below is a simplified version of that from AS ISO 31000-2018 and has been used to assign the risk ratings to the identified hazards.

Risk Matrix			Probability				
			A	**B**	**C**	**D**	**E**
			Almost Certain	**Likely**	**Possible**	**Unlikely**	**Rare**
			Possibility of Repeated Incidents	Possibility of isolated incidents	Possibility of occurring sometime	Not likely to occur	Practically impossible
Consequences	**1**	**Catastrophic**	**Extreme**	**Extreme**	**Extreme**	**High**	**High**
	2	**Major**	**Extreme**	**Extreme**	**High**	**High**	**Medium**
	3	**Moderate**	**Extreme**	**High**	**Medium**	**Medium**	**Medium**
	4	**Minor**	**High**	**Medium**	**Medium**	**Low**	**Low**
	5	**Negligible**	**Medium**	**Low**	**Low**	**Low**	**Low**

	Health & Safety	**Assets**	**Reputation**	**Financial**	**Environmental**
Catastrophic	Many Fatalities	$10 Million	International Media	Corporate	Large Community
Major	Single Fatality	$1 Million	National Media	Region / Affiliate	Small Community
Moderate	Many Injuries	$100 thousand	Local Media	Division / Site	Minor
Minor	Single Injury	$10 thousand	Some Media	Other	Minimal to None
Negligible	LTI	$1 thousand	No Media	Negligible	None

Hierarchy of Risk Controls

Consideration is given to the risks identified and implementing the highest level of control in a set hierarchy of controls, which are: -

- Eliminate the hazard
- Substitute or isolate the hazard
- Implement an engineered solution

The above 3 controls are the proactive, preventive controls to manage hazards. The next 2 controls are the weakest in the hierarchy, only to be used when the 3 controls above are found to be not reasonably practicable

- Implement an administrative solution
- Provide personal protective equipment (PPE)

Depending upon the level of risk for each hazard the Standards make recommendations for the most appropriate method for mitigation of the risk. There will be occasions where local conditions or usages could work against the implementation of these recommendations. Under such conditions alternative solutions may be implemented so long as it can be demonstrated that these solutions provide at least an equivalent level of safety.

What is Reasonably Practicable?

Section 18 of the WHS Act provides the concept of reasonably practicable that will be used by authorities when determining whether the obligations of the design team have been met. This section is copied below -

In this Act, reasonably practicable, in relation to a duty to ensure health and safety, means that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including—

(a) the likelihood of the hazard or the risk concerned occurring, and

(b) the degree of harm that might result from the hazard or the risk, and

(c) what the person concerned knows, or ought reasonably to know, about—

(i) the hazard or the risk, and

(ii) ways of eliminating or minimising the risk, and

(d) the availability and suitability of ways to eliminate or minimise the risk, and

(e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

12.2 Hazard Assessment – Class 3 Flammable Liquids and Combustible Powders

Depots 19 & 20

Location	Hazard	Consequence		Risk Rating – No Controls	Risk Mitigation Strategies	Residual Risk – With Controls
		On-site	Environment			
Flammable liquid packages up to 1,000 L	Slow leak due to minor failure of IBC valve or drum seal.	Gradual but substantial pool of flammable liquid in the bund. Possible ignition causing pool fire which develops to larger fire over time. If left unattended there could be propagation to the surrounding environment.	Minimal if the plume does not ignite before dispersing. Fire could cause grass and forest fire on the freeway reserve. Factory buildings are sprinkler protected. Fire introduces the potential for toxic smoke generation, which may adversely affect organisms in the area. Pollution from contaminated fire-fighting water.	Consequence 3 Probability C Risk Rating - Medium	• Conversion of manufacturing to water based technologies in 2031 • Area bunded to capture spills, figure 6 • Selleys warehouse is approx. 10 m from the Depot. • Flammable liquids segregated from incompatible classes. • Ex-rated electrical fittings inside hazardous areas • Drum and IBC storage is in pallet racking and height restricted. • Forklifts compliant with AS 1915 for use in hazardous area zone 2. • Security firm employed 24/7 • Site containment systems and isolation valves in stormwater pits are in place to prevent any loss of containment of contaminated firewater runoff.	Consequence 4 Probability D Risk Rating - Low

Location	Hazard	Consequence		Risk Rating – No Controls	Risk Mitigation Strategies	Residual Risk – With Controls
		On-site	Environment			
Flammable Liquids – Catastrophic Leak	Forklift Impact with racks causing collapse and significant breakages of containers	Large plume of flammable vapours in the direction of the prevailing wind. Ignition could cause a fire or explosion that may propagate back to the spilled liquid in the bund. An explosion would likely damage the nearby buildings. People in the vicinity would likely suffer minor to major injuries.	Explosion could cause serious damage to nearby infrastructure Fire could cause grass and forest fire on adjacent environmental reserve. Fire introduces the potential for smoke generation, which may adversely affect organisms in the area. Pollution from contaminated fire-fighting water	Consequence 2 Probability C Risk Rating - High	• Conversion of manufacturing to water based technologies in 2031 • Bollards and guardrail are provided at ends of racks • Speed is restricted. • Fire detection and alarm • Early response to external fire. • Adjacent buildings are sprinkler protected. • Emergency response plan includes closing openings to all buildings and shutting air intakes in direction of the plume. Evacuation of all people in the path of the plume. • Stormwater drains will be designed to provide the separation required by AS/NZS 1940. • Ex-rated electrical fittings inside hazardous areas • Site containment systems and isolation valves in stormwater pits are in place to prevent any loss of containment of contaminated firewater runoff.	Consequence 4 Probability D Risk Rating - Low

Depot 1 – Underground Tanks

Location	Hazard	Consequence		Risk Rating – No Controls	Risk Mitigation Strategies	Residual Risk – With Controls
		On-site	Environment			
Flammable liquid fill points - Overfill of tank	Flammable liquid spill that could ignite causing major fire	Gradual but substantial pool of flammable liquid in the bund. Prevailing winds could result in exposure to vapours causing respiratory harm. Possible ignition causing pool fire which develops to larger fire over time. If left unattended there could be propagation to the surrounding environment.	Minimal if the plume does not ignite before dispersing. Fire could cause destruction of the delivery vehicle. Factory buildings are sprinkler protected. Fire introduces the potential for toxic smoke generation, which may adversely affect organisms in the area. Pollution from contaminated fire-fighting water.	Consequence 3 Probability C Risk Rating - Medium	• Conversion of manufacturing to water based technologies in 2031 • Underground storage insulates majority of the flammable liquids from exposure to a fire. • Area bunded to capture spills, figure 6 • Contents gauge with overfill alarm located at the fill point • Automated mechanical overfill protection is provided for the underground tank filling points. • Warehouse is approx. 10 m from the Depot. • Ex-rated electrical fittings inside hazardous areas • Spill kit and fire fighting equipment are located within close proximity to the delivery driver during filling operation. • Site containment systems and isolation valves in stormwater pits are in place to prevent any loss of containment of contaminated firewater runoff.	Consequence 4 Probability E Risk Rating - Low

Flammable liquid fill points – Leak in pipework	Flammable liquid spill that could ignite causing major fire if above ground and soil contamination if below ground.	**Above Ground** Gradual but substantial pool of flammable liquid in the bund. Prevailing winds could result in exposure to vapours causing respiratory harm. Possible ignition causing pool fire which develops to larger fire over time. If left unattended there could be propagation to the surrounding environment. **Below Ground** Possible seepage causing pollution of the nearby waterway	**Above Ground** Minimal if the plume does not ignite before dispersing. Fire could cause destruction of the delivery vehicle. Factory buildings are sprinkler protected. Fire introduces the potential for toxic smoke generation, which may adversely affect organisms in the area. Pollution from contaminated fire-fighting water. **Below Ground** Major environmental cleanup. Significant reputation damage.	Consequence 3 Probability C Risk Rating - Medium	• Conversion of manufacturing to water based technologies in 2031 • Pipework located underground is protected from impact damage. • Fill points fitted with back check valves to stop outward flow. • Stock reconciliation is performed regularly and would highlight leaks. • Above ground pipework is installed over bunded area, figure 6 • Interstitial monitoring and associated interlocks and alarms ensure underground leaks are detected. • Flexible tanker connection hose is pressure rated, can lie flat on the ground and uses standard couplings. • Tanker is fitted with an emergency stop system in event of major leak. • Site containment systems and isolation valves in stormwater pits are in place to prevent any loss of containment of contaminated firewater runoff. • Regular maintenance checks on fill point equipment. Delivery drivers will report any malfunctions. • Collision by delivery vehicle prevented by fill point being below ground level. • Grounding cable attachments provided. • Ex-rated electrical fittings inside hazardous areas. Mobile phones not to be used.	Consequence 4 Probability E Risk Rating - Low

Location	Hazard	Consequence		Risk Rating – No Controls	Risk Mitigation Strategies	Residual Risk – With Controls
		On-site	Environment			
Flammable liquid fill points – External Fire	Flammable liquid spill could propagate fire.	Development into a larger fire could affect nearby buildings.	Fire introduces the potential for toxic smoke generation, which may adversely affect organisms in the area. Pollution from contaminated fire-fighting water.	Consequence 4 Probability D Risk Rating - Low	• Line of sight gas detection provided at fill points to automatically prevent pumping if solvent vapour is detected. • Emergency shutdown system provided to stop flow. • Delivery tanker is fitted with emergency stop system to shutdown in an emergency. • Local fire extinguisher is provided. • Site containment systems and isolation valves in stormwater pits are in place to prevent any loss of containment of contaminated firewater runoff.	Consequence 5 Probability E Risk Rating - Low

Location	Hazard	Consequence		Risk Rating – No Controls	Risk Mitigation Strategies	Residual Risk – With Controls
		On-site	Environment			
Powder Handling	Finely divided combustible solids may ignite resulting in a dust explosion.	Harm to people in the vicinity of the blast wave from overpressure and flying debris. Damage to equipment causing loss of containment in mixing vessels or filling lines. Minor possibility of fire due to low fuel load in the area.	Minimal if small quantities of dust involved in an incident. Pollution from contaminated fire-fighting water, if applied.	Consequence 3 Probability E Risk Rating - Medium	• Emergency shutdown system provided to stop flow in other lines. • Area bunded to capture spills from mixing tanks or filling lines. • Powder handling is approx. 10 m from the main Depots. • Combustible powders segregated from incompatible classes. • Ex-rated electrical fittings inside hazardous areas • Forklifts compliant with AS 1915 for use in hazardous area zone 2. • Site containment systems and isolation valves in stormwater pits are in place to prevent any loss of containment of contaminated firewater runoff. • Local fire extinguisher is provided. • Mixing vessels and supply lines are nitrogen filled to prevent ignition.	Consequence 4 Probability E Risk Rating - Low